For the purpose of my new learning I have chosen to focus on Indicator #4 which states: “Leading students to construct meaning through the use of active learning strategies such as purposeful discourse and/or inquiry based learning.” My goal is to work with my 17 kindergarten students on early math skills. I will help my students work with each other to solve problems and play math related games and utilize center activities. We will also work on asking questions when learning about math and checking for understanding. I hope to develop my teaching skills in the areas of differentiation and adjust my instruction based on assessments. I feel that both teaching and learning should always be purposeful and meaningful. This comes from students being engaged. I noticed at the beginning of this year my students were more interested in telling stories than focusing on the lesson. My questioning has focused on recall and comprehension and through this module I hope to learn and develop strategies that will promote purposeful discourse, rigorous questioning and inquiry based learning.

In the beginning of the school year my students struggled with questioning especially during math time. I would ask a question and be met with silence because I was not giving them enough information to answer the question. Then I found myself simply guiding them to the correct answer instead of giving them the time to think. To improve my practice my mentor suggested various resources; specifically books by John A. Van De Walle and Debbie Diller that dealt with appropriate teaching strategies and math centers. I also spent time observing one of my grade partners and had many conversations with my kindergarten team members as well as multiple meetings with our school's numeracy coach.

Teaching Student Centered Mathematics by John A Van de Walle focuses on developmentally appropriate instruction for teachers of grades Pre-K-Grade 2. One section in particular is titled "Orchestrating Classroom Discourse" and this is a section I studied and read

through at length. "Paying attention to children's ideas sends the message that their ideas are valued." (Van de Walle, Lovin, Karp, Williams, 2014) Reading this quote made me think about how I was running my daily math lessons and how I was responding when students gave me an answer. I felt that I was quick to tell them something like "good try" or "maybe, try again" when they gave me a wrong answer. This resource helped me to think about other ways to respond to my student's answers and how to help them to use more language to explain how they came to the answer they gave. Van de Walle indicates in his book that during a questioning time my role as a teacher is not to simply get an answer from a student and move on, but to try to understand the students' thinking. From reading this resource, I began to question my students differently asking them to tell me how they got their answer. "Explain your brain" I began to tell them, "tell us how you got your answer." I don't like to say "tell me why you think that is right" because I feel that it makes them self-conscious and they may think they are wrong. By using this new way of expansion on questioning and answers I have seen more class participation and more language from my students. Van de Walle also states that student to student thinking should be used and encouraged. I began to pay more attention to this during whole class instruction and encouraged my students to "turn and talk" with a friend nearby to share different views or ideas when I presented them with a problem. In the beginning of the year when I tried this, many students were off task and not talking about math during their turn and talk discussions; they were simply glad for the opportunity to talk with friends! I began to model for them what a turn and talk should look like and sound like demonstrating with a student both the right and wrong way to talk with a classmate. They recognized when I exaggerated the wrong way to turn and talk. They all laughed when I talked to my partner about my dog when it should have been about how many counters I had in my ten frame. After modeling this for them a couple of times they began to

understand the importance of staying on task and I noticed more math language being used. "I think the top row has more," “I think the bottom row is less." "Yeah because 5 is bigger than 4." "But they are almost equal." This recent development shows examples of how student discourse has improved in math due to the turn and talk practice.

By reading the Debbie Diller book, Math Work Stations: Independent Learning You Can Count On, K-2 I was able to focus on another aspect of math instruction: the independent learning centers. In the beginning of the year I simply allowed the students to explore the various classroom manipulatives having them focus mainly on sorting and making patterns. I quickly realized however that this would not be enough differentiation for my students and began to question what else I could do. Debbie Diller's resource allowed me to see what the purpose of a math work station should be "Choice is an important feature in making math stations successful. Over time, a station should include a variety of things for children to choose from but there shouldn't be so many choices that the children feel overwhelmed." (Diller, 2011) Debbie Diller also talks about the importance of math stations because then they are not just sitting at a desk completing a worksheet, they are actually able to explore and put those newfound math skills to use. In order to incorporate inquiry based learning I developed math centers, as a result of this, all students participate in work stations and I am able to circulate around the room and see who is successful and who may be struggling in certain stations. I am able to differentiate using classroom materials in various way. For example giving smaller numbers for students who struggle with one to one correspondence and number identification. One game called "Shake and Spill" consists of students shaking 2-sided plastic counters and then spilling it onto the table. One counter's side is red and one is yellow, students then count how many yellow and how many red then compare the amounts or can add or subtract the colors. Students usually use 10 counters,

however, for higher performing students I give them anywhere from 10-20 counters and a bigger container to shake them in, and for students who struggle I give them anywhere from 5-8 counters to work with. Due to this appropriate scaffolding I see a lot of engagement from my students and inquiry based learning has increased due to the change in practice of incorporating daily math centers.

By talking with my grade partners and our school's numeracy coach I slowly began developing some ideas for math centers. I began to move away from just patterns and sorting and began creating centers that were more tailored to the skills we were working on in the classroom. I searched for ideas on the internet and consulted with my colleagues. Some of my centers included: puzzles that required students to put numbers in order, writing numbers in math journals, using foam ten-frames and dice to create a game. I was mindful when I was making math groups and created them based on assessment data I had collected from the beginning of the year. Along with my lack of math center ideas I was also concerned about my student's discourse during the center times. The students were not interacting well and did not get along. They grabbed items from each other and did not take turns. I worked daily with my students on their conduct with each other and three times a week carried out lessons from our social skills curriculum referring back to it often. Towards the end of the semester I began to notice the change in my student's conduct with each other. I observed and took notes on the discourse between them during math centers. I then used this information to conference with students about their math thinking. As a result, I noticed a decrease in interruptions and an increase in discussions related to the math content being presented. Instead of hearing "gimme!" or "it's mine!" I heard much more useful interactions such as "You can go first" "We're equal! We got

the same number!" and "Let's try a different number." I was so proud of my students and what they had accomplished in what I felt was actually a short time.

As I began creating my math stations I put thought into how my students should be grouped for these centers. The students were grouped based on the academic levels and needs of my students according to classroom assessments I conducted at the beginning of the year. At the beginning of the year my students' number identification was very low and I had only one student who could count to 100 independently. My mentor gave me an article titled Making Math Meaningful for Young Children by Deanna Pecaski McLennan which discusses the importance of inquiry based learning during math centers. The article states that teachers should ask "open ended questions that promote problem solving and probe and challenge children's mathematical thinking and reasoning." (*Teaching Young Children* Vol 8 No1) It was fine for me to have the children use various manipulatives in the classroom during math centers at the beginning of the year but I was not actively showing them all the things they could be doing with them. I was very concerned with their behaviors with each other as well as their lack of mathematical skills. However, as the year continued I began to think of ways to get my students more engaged in centers. The article by Mc Lennan also talks about the importance of the teacher involving themselves in the centers with the students. Even though they were still using basic manipulatives in small groups, I began to insert myself into their thinking. I chose a table and used manipulatives to create a pattern myself and then asked a small group, "What do you notice about this? Can you make the same one? Can you make a different one?" By involving myself in the actual learning as opposed to just observing it, the students quickly became engaged.

When doing a daily math lesson I usually began with a number mini lesson; displaying different ways to show a number, introducing a new math vocabulary word or even reading a math book before launching into the lesson which consists of the students following along on their worksheet with what is being projected on the screen. When I first began these lessons they took a lot of time, way more than they should have. Math was proving to be very difficult for my students to understand. There were many interruptions due to behavior problems and I found myself simply standing in the front of the room asking students for attention. I thought about why the lesson could be taking so long and one thing I realized was that I was really pushing my students to get through each page. I decided that this was unnecessary and spoke with my team about how they do their lessons.

During this time, I observed one of my grade partners and made notes on how she carried out a math lesson. One thing I noticed right away was the difference in how she approached the lesson from the beginning. She began the lesson by doing a countdown from 5 to 1 to allow the student's time to show the expected behavior to begin the lesson. She began the lesson with a Number Talks lesson which focused on looking at numbers arranged different ways. She asked the students "How many dots are there? How do we see them?" and accepted all answers she was given. I also noticed that she gave a quick review to activate prior knowledge "Yesterday we talk about..." she also stated the daily objective and had the students repeat it. I really picked up on how her class was responding to these small changes I was not yet incorporating into my lesson. I began doing the much of the same and was surprised at how much time this saved and how quickly we were able to get through a lesson. I was given the books Number Talks to use as a resource in the classroom. It came with a DVD which showed teachers carrying out various lessons. One thing I learned is that the purpose of Number Talks is to help the students

understand *why* they are doing what they're doing in math. In the video a teacher used "dot plates" to show how numbers can be arranged in different ways. I recognized this from the lesson I observed my colleague doing. I got to work right away and made my own but used note cards instead. I used them to introduce my math lesson the next day. I showed them one card with 5 across and asked "What do you see?" instead of asking "how many dots are there?" When I heard an answer of "dots!" I said "great how many are there?" then expanded my questioning to ask how they saw them. I heard answers such as "in a row" "in a line" "all together" and then showed them a group of 5 in a different way and asked them similar questions but always asking for elaboration and checking for understanding. I continued using dot cards as the days went on using different numbers then also began showing the students different ways to make these numbers using tally marks, the written number word, and ten frames.

As the months went on, my student's number identification improved dramatically and this made math lessons much easier. Through a re-assessment I was able to see firsthand how much the students had improved in their number identification and this made the EnVisions lessons move faster. I began asking them more questions during the lesson, essentially having them do the majority of the work using the knowledge I had taught them and then inviting them to "explain their brain" to the class when giving an answer. By actually involving the whole group in the whole group lesson, as opposed to me just talking and taking them through the lesson, I found that the lesson was going much faster and students were even enjoying it! At the beginning of the interactive part of the lesson, I made sure to make the students aware of the expected behaviors during the lesson and made sure to circulate around the room while teaching to make sure students were staying on task. We spent a lot of time in the beginning of the school year making ten frames in various ways and have recently begun

addition and subtraction. I have been pleasantly surprised at how well the students are grasping these concepts and some of them have even expressed that math is fun!

When I first began work on this module, I was eager to find ways to elaborate on my teaching and help my students to become better learners. Based on the interactions of my students at the beginning of the school year I knew that focusing on discourse would be very important. When I would at first simply correct their behaviors with each other I now only have to give simple reminders or sometimes none at all. This is because their discourse while working together has improved so much they no longer argue and fight over materials. I have helped them learn to take turns and share and have assisted them in developing the appropriate language to use when working together. The evidence of this is listening to them work and hearing "Your turn" and "Great job!" I have also worked on developing their inquiry based learning. When I used to simply guide them to the correct answers I now accept all answers given and may ask the students to elaborate on their thinking to determine how they came to their answer. I am careful to involve all students in my questioning even if they are struggling. By doing this it consistently facilitates the student's engagement in active learning strategies and over time will lead to student independence. In the beginning of the school year I had two students who really struggled to understand all concepts of math. I tried to teach the lesson to whole group then had to pull these students separately to basically re-teach the lesson. Since I have changed my instruction and developed this inquiry based learning these students now participate in class discussions and are often eager to give answers, I am only more than happy to hear them explain their thinking! By using instructional strategies that scaffold learning and promote curiosity about the content I am leading students to develop questions and explore solutions to problems on their own.